

# IQONY Projects on Repowering and Repurposing – Enhancing power plants' site potential



# Agenda

1

Introduction of  
STEAG and  
Iqony

2

Setting the Scene

3

Herne Site

4

Fenne Site

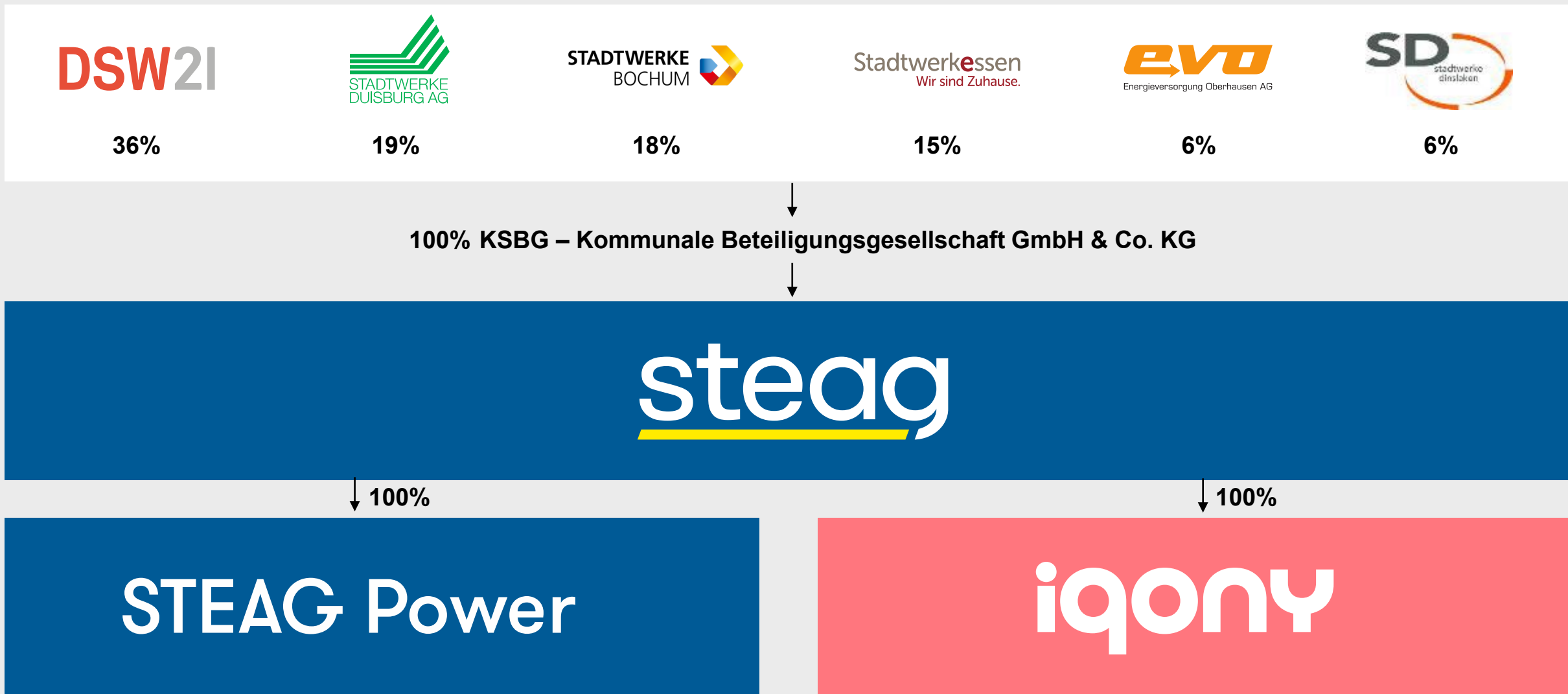
5

Duisburg Site

6

Summary and  
Outlook

# Our shareholder structure



We are at home in Germany and Europe. Cross-divisional cooperation creates customer proximity and synergies.



**90 MW**

battery storage system  
(further projects in planning)

**623 MW**

from renewable  
sources of energy

**725 MW**

modern combined cycle power  
plant, partly H<sub>2</sub>-ready

**4.268 MW**

operational management  
and support for regenerative  
generation

**≈ 380.000**

calculated households supplied  
with district heating  
at the Ruhr and Saar area

**≈ 1.390 km**

district heating network  
at the Ruhr and Saar area

**>2.000**

IT systems delivered

**80**

countries with project  
experience



Present in Germany,  
Europe, Switzerland  
and Brazil

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1

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5

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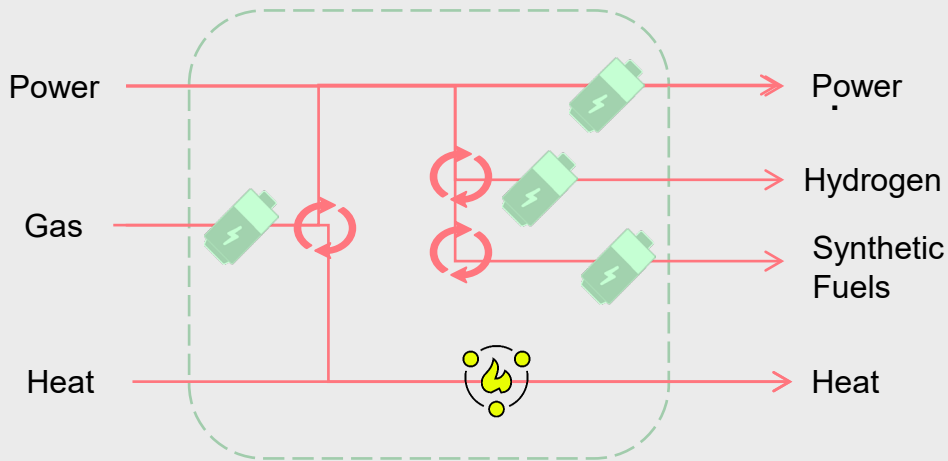
6

Summary and  
Outlook

# Sector Coupling, Multi Energy Systems and Energy Hubs

## Hub<sup>1</sup>

- › the central or main part of something, where there is most activity.
- › the central part of a wheel into which the spokes are fixed.
- › a machine that connects several computers together [IT].

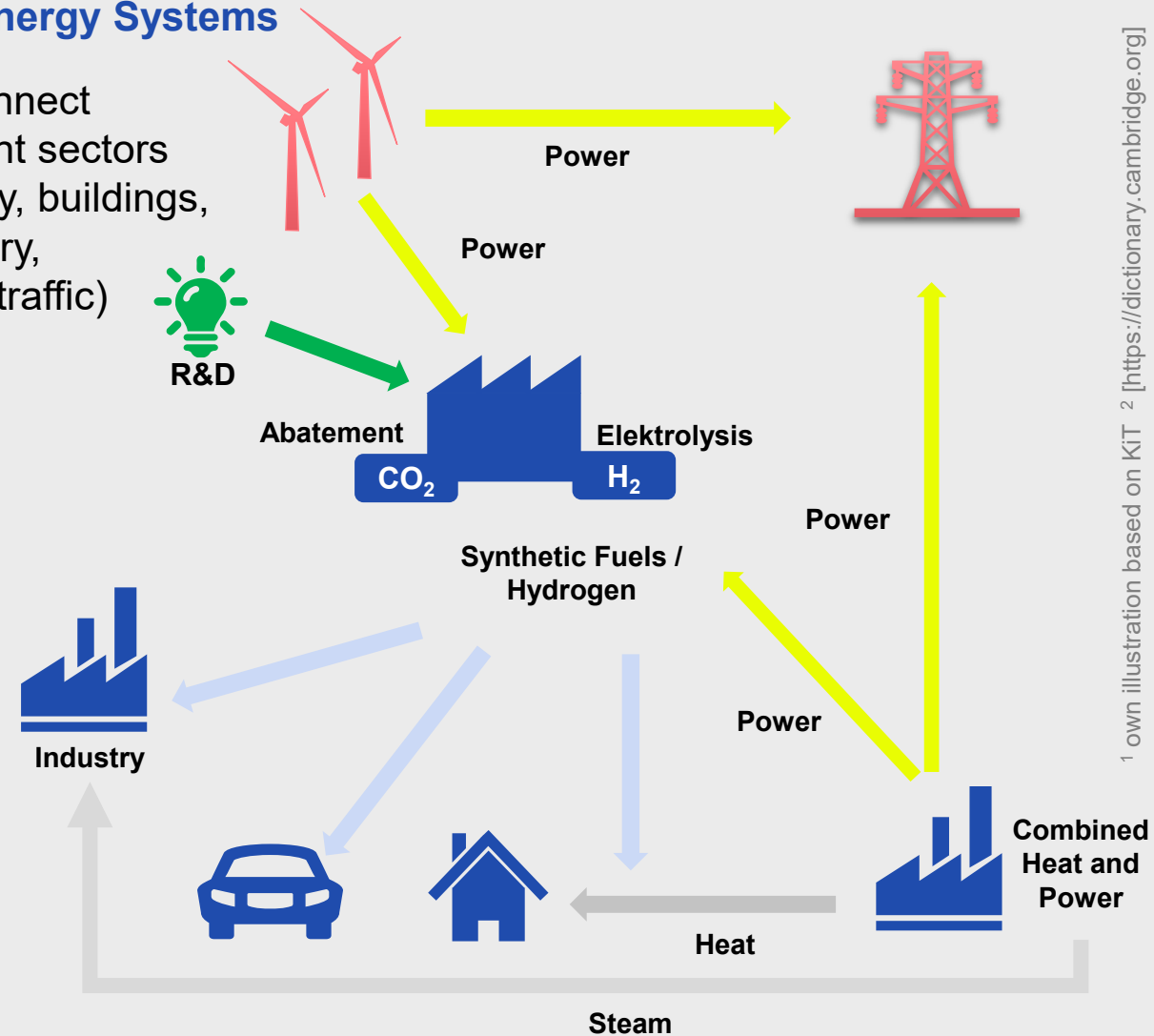


## Energy Hub<sup>2</sup>

- › are sites, where different energy sources are used, transported, converted or stored.

## Multi Energy Systems

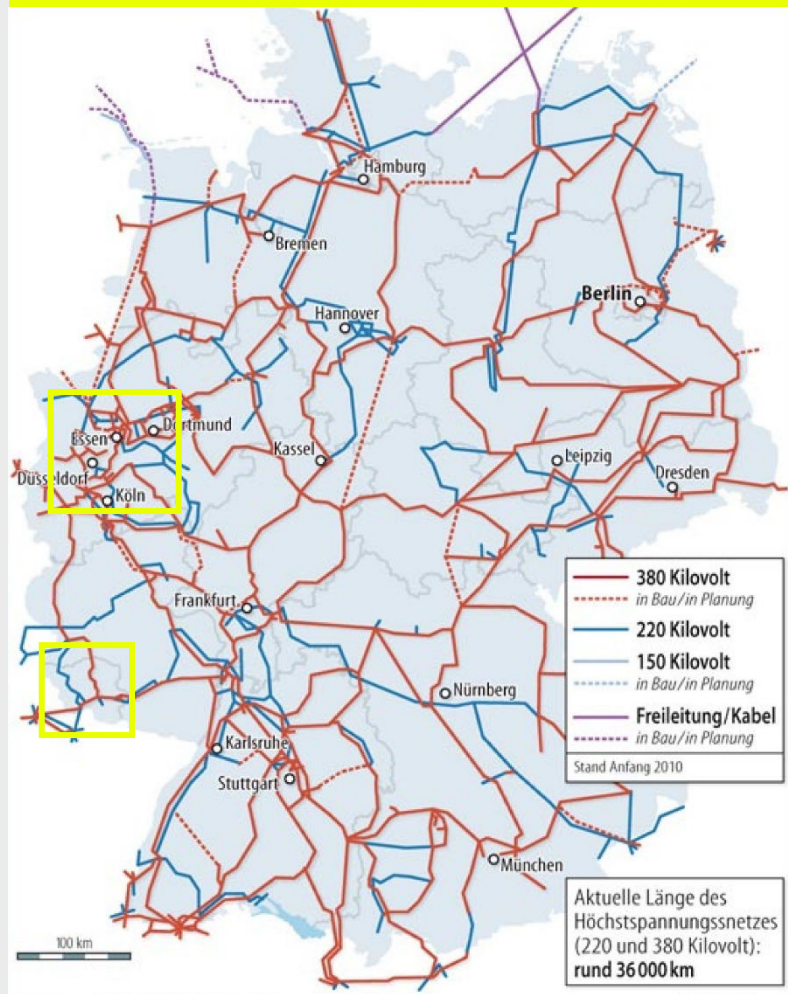
- › the connect different sectors (energy, buildings, industry, trade, traffic)



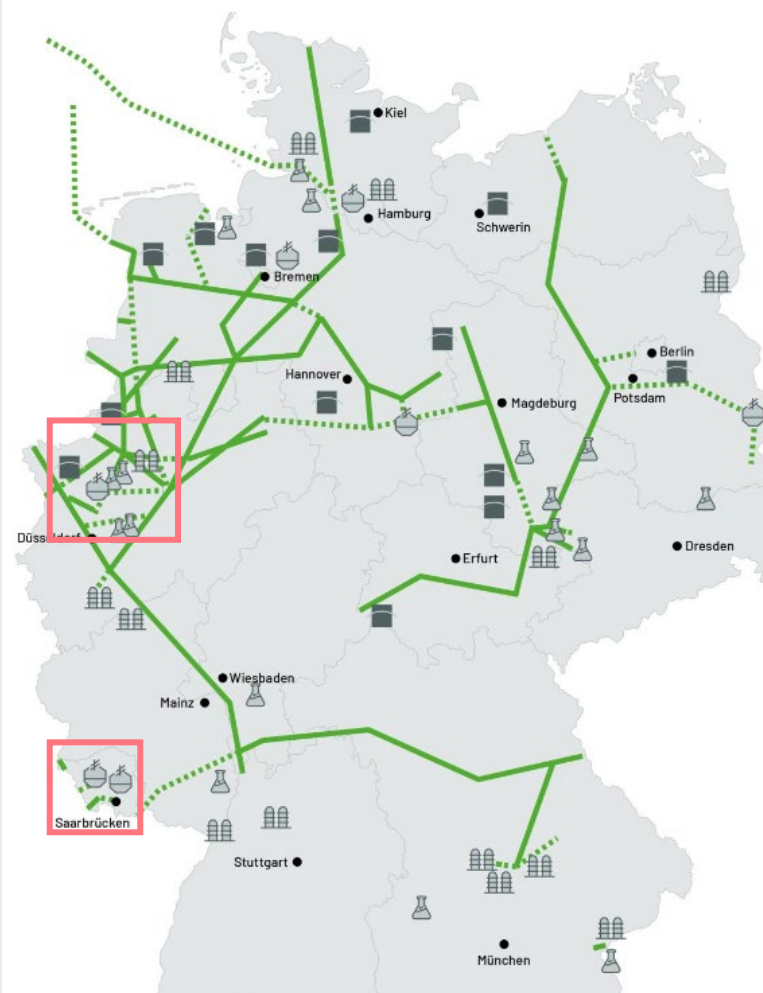


# The utilisation of existing energy infrastructure even from coal industry is an economic must

## High Voltage Grid



## Future Hydrogen Backbone

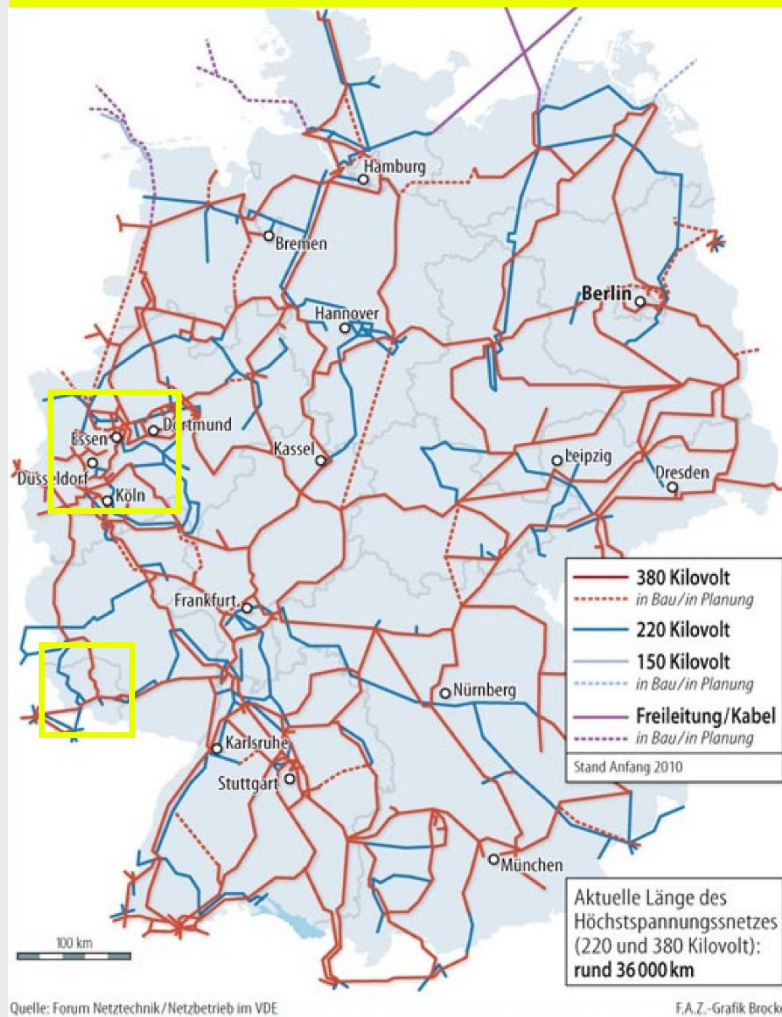


## Future CO2 Grid

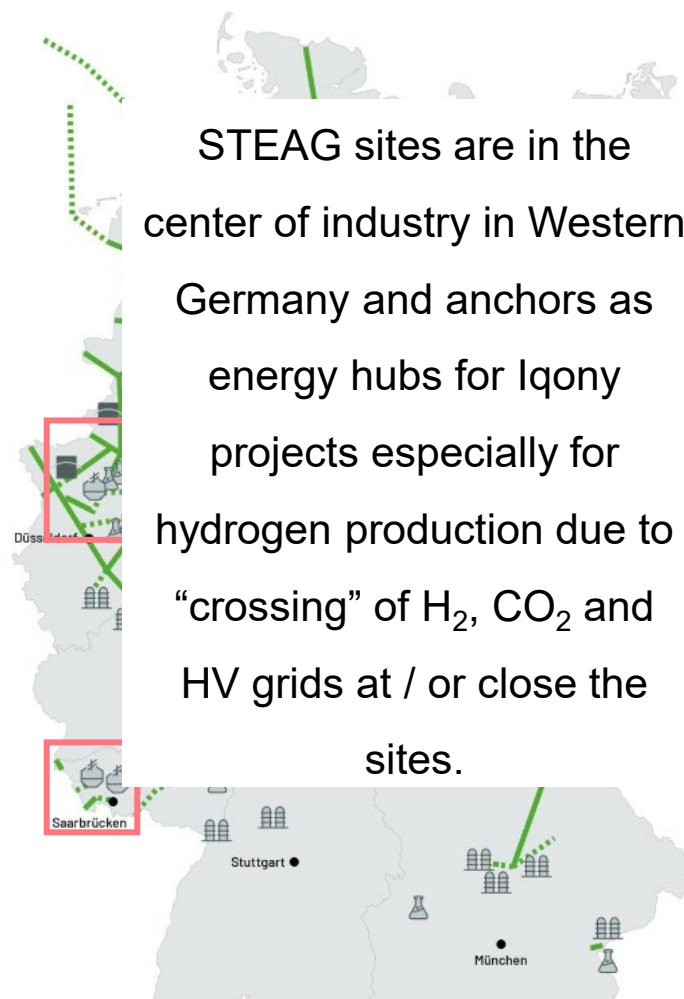


# The utilisation of existing energy infrastructure even from coal industry is an economic must

## High Voltage Grid



## Future Hydrogen Backbone



## Future CO2 Grid





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3

Herne Site

4

Fenne Site

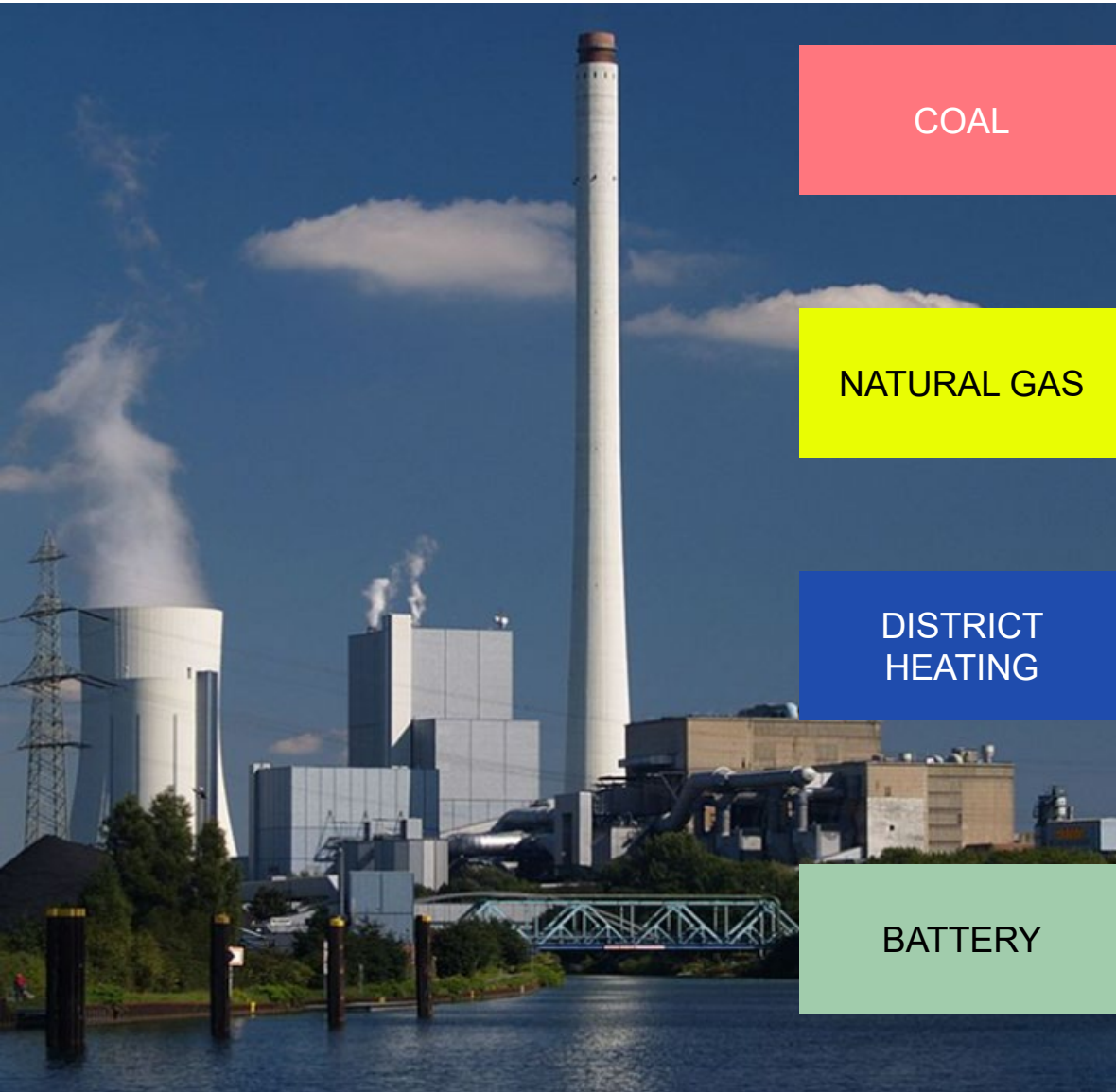
5

Duisburg Site

6

Summary and  
Outlook

# Herne Power Plant Site



COAL

- 1962 – 2000 Unit 1 – 150 MWel
- 1963 – 2014 Unit 2 – 150 MWel
- 1966 – 2017 Unit 3 – 300 MWel
- 1989 – ongoing Unit 4 – 500 MWel, 550 MJ/s

NATURAL GAS

2022 – ongoing – Unit 6 – 650 MWel, 400 MJ/s

DISTRICT  
HEATING

Since the 70ties main supplier of the STEAG heating network with

- Grid length of 714 km
- 275,000 Customers
- 1.6 TWh heat supply

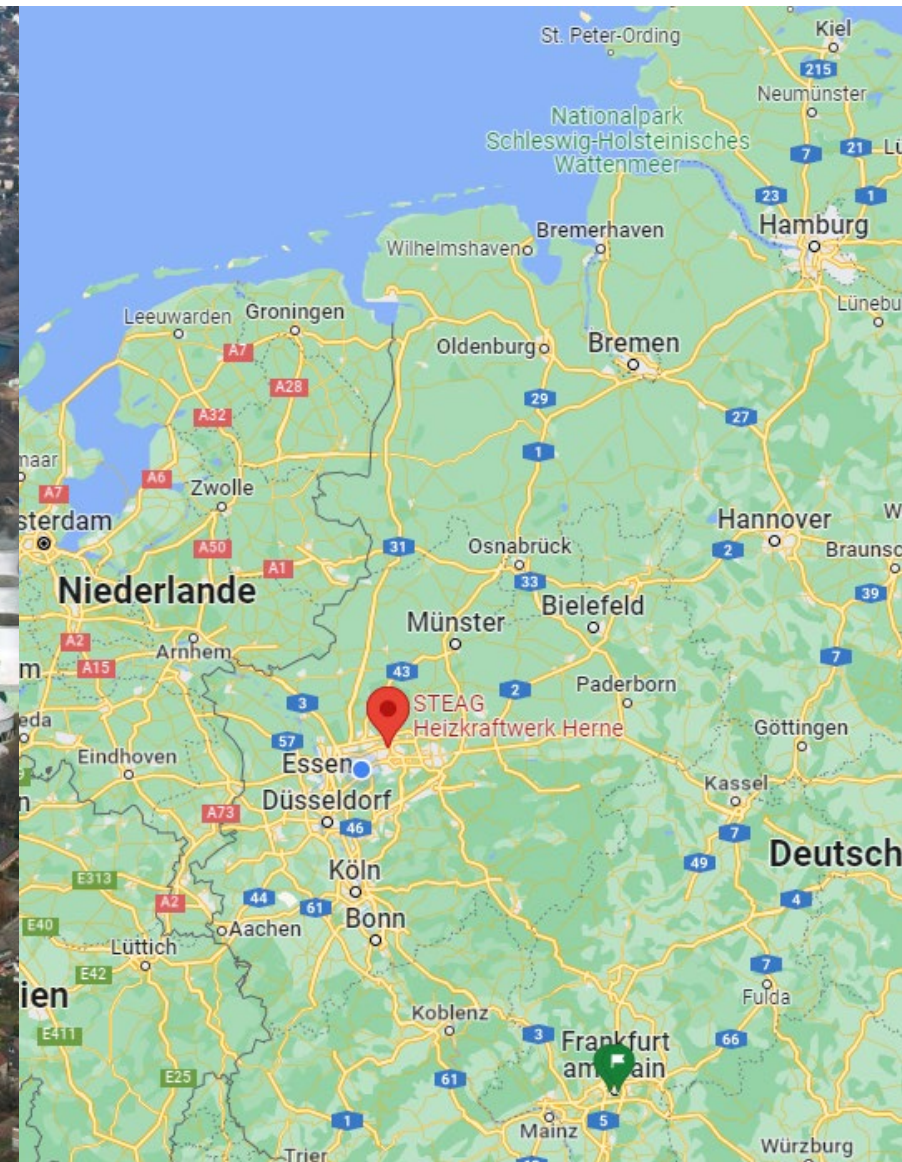
BATTERY

2016 – ongoing – Battery System (BESS) 15 MW, 20 MWh

- Frequency Control



# Power Plant Herne





# Combined cycle power plant Herne

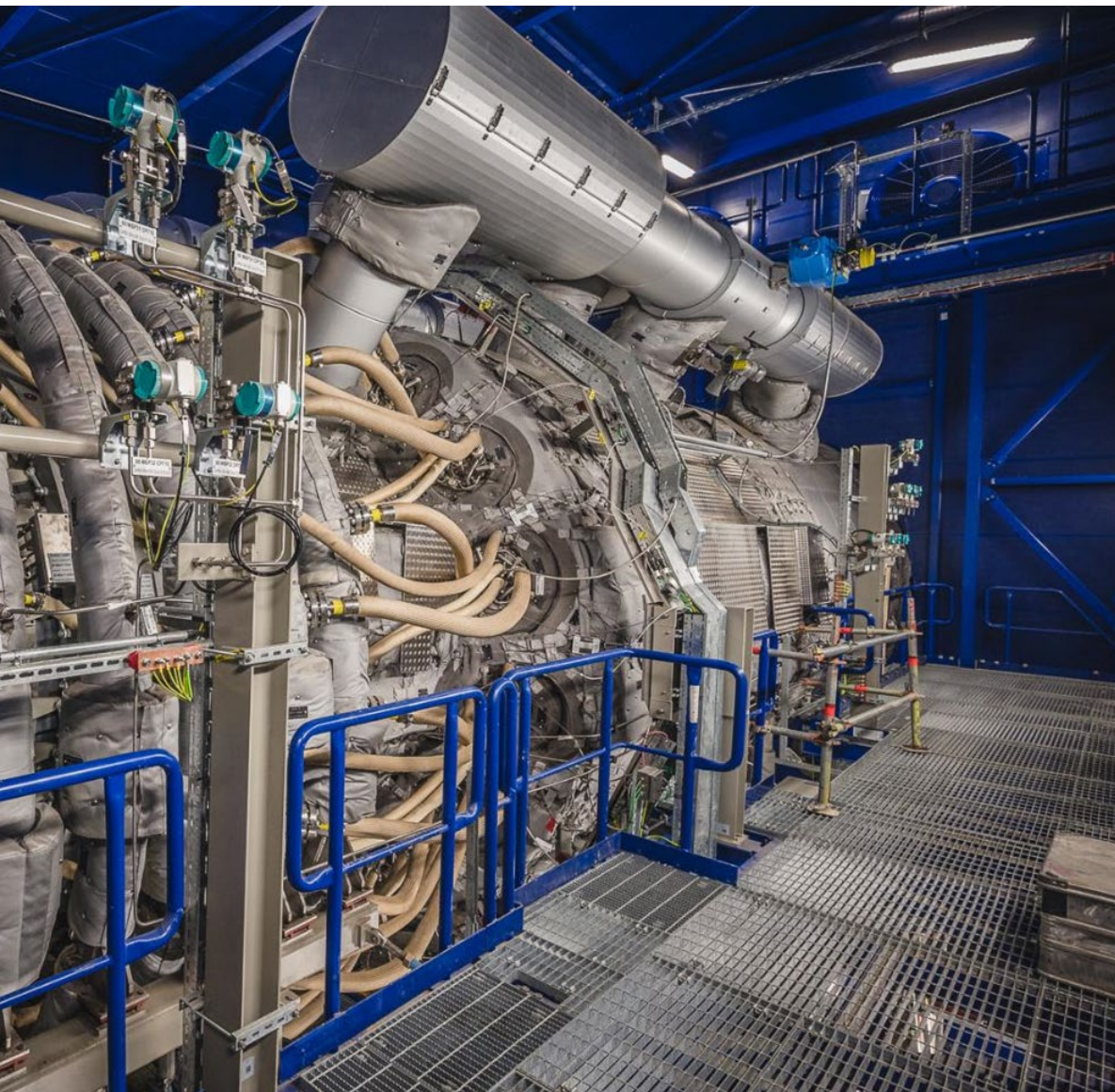
Project Combined Cycle Power Plant Herne

<b>Project type and fuel</b>	Single-shaft-combined-cycle-power-plant/natural gas
<b>Location</b>	CHP Herne (STEAG)
<b>Project volume</b>	Approx. 500 Mio. € (incl. financing costs and approx. 17 Mio. € site measures)
<b>Project financing</b>	Non-Recourse-project financing, credit period 20 years from Financial Close, CHP funding according to KWKG
<b>Capacity (Gross)</b>	~650 MW in condensing operation, District heating 400 MJ/s
<b>Overall efficiency</b>	More than 85% with full district heating decoupling
<b>Electrical efficiency</b>	More than 60% in condensing operation

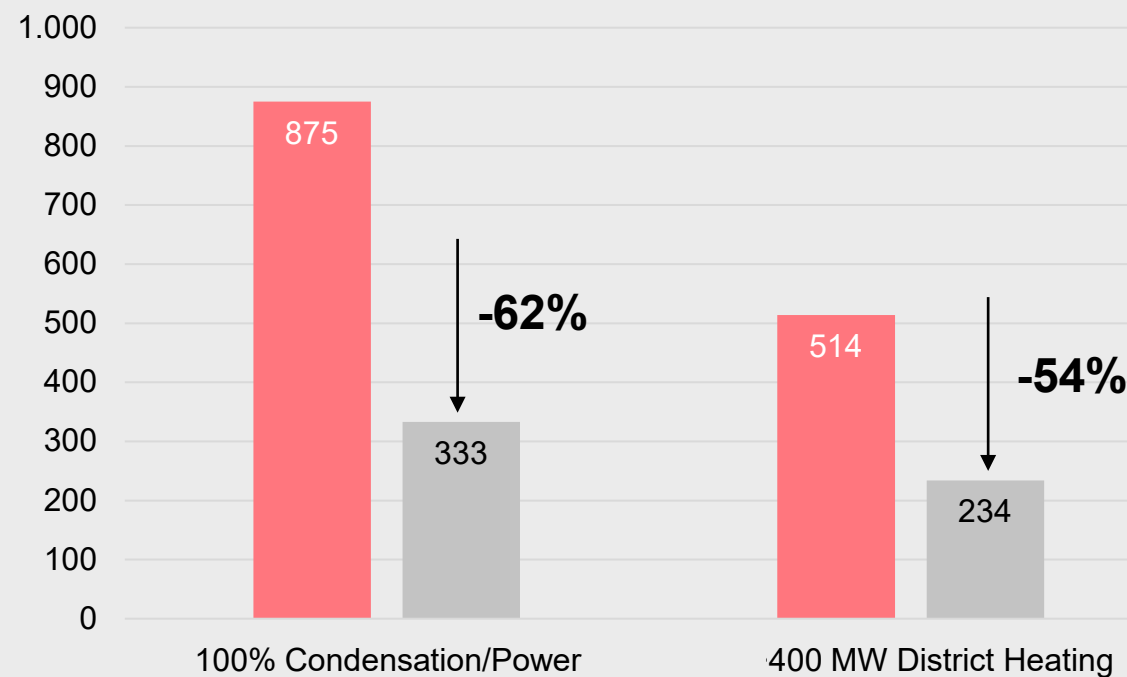




# Significant CO<sub>2</sub> emissions Reduction



kg CO<sub>2</sub>/MWh<sub>el+th</sub>



■ Herne 4 ■ CCPP Herne 6

Specific emission factors: natural gas 200 kg CO<sub>2</sub>/MWh(H<sub>U</sub>); hard coal 335 kg CO<sub>2</sub>/MWh  
 The electrical output drops by 88 MW (theoretically) in the CCPP plant at 400 MJ/s heat extraction, and by 70 MW in Herne 4.

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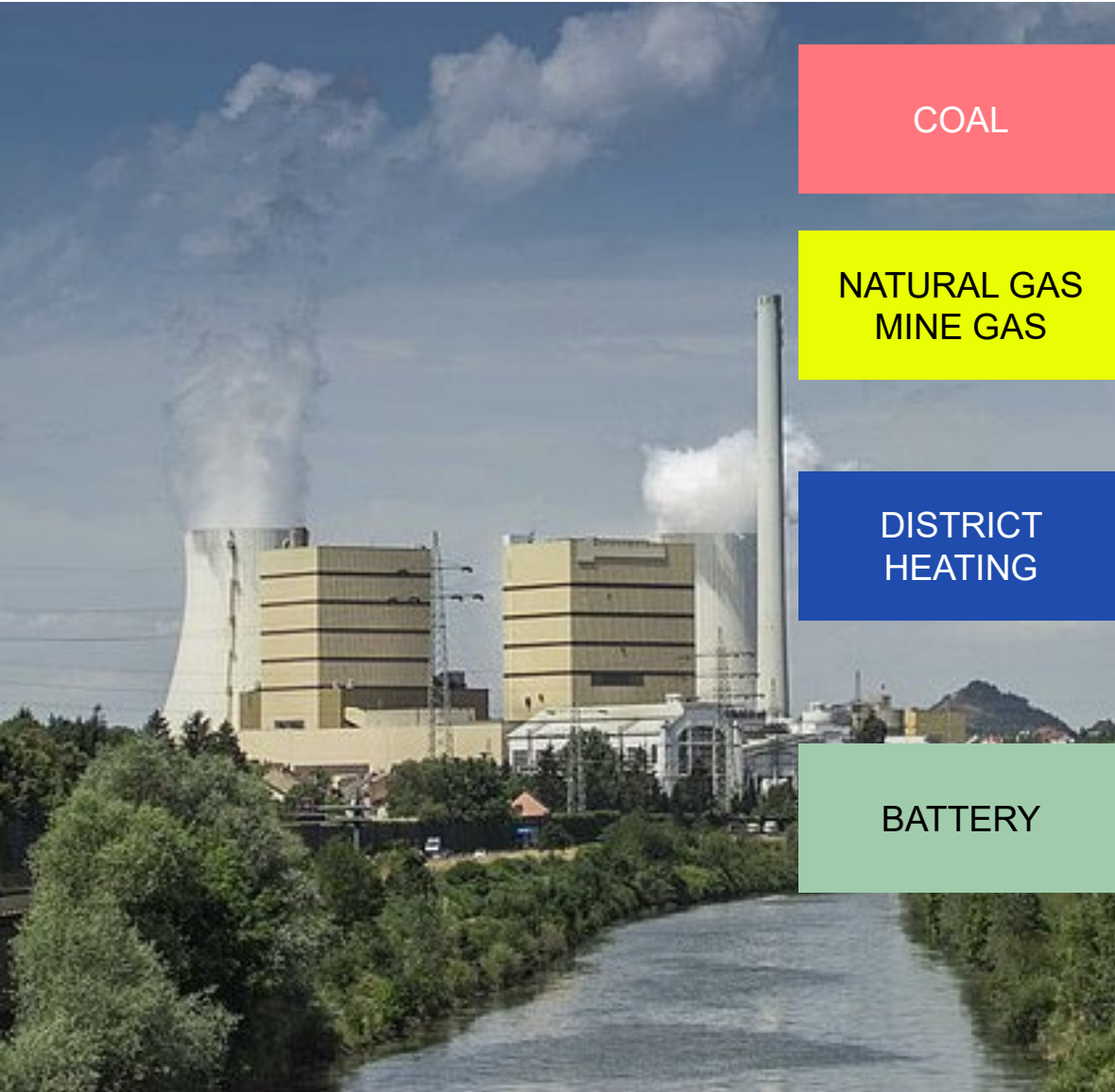
5

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6

Summary and  
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# Völklingen Fenne Power Plant Site



COAL

- 1982 – ongoing MKV – 179 MWeI
- 1989 – ongoing HKV – 210 MWeI

NATURAL GAS  
MINE GAS

- 1989 – ongoing – GT 35 MWeI with HRSG
- 2002 – ongoing – Gas engines for mine gas 42 MWeI

DISTRICT  
HEATING

Since the 70ties main supplier of the FVS heating network with

- Grid length of 600 km
- 14,000 Customerns
- 0.5 TWh heat supply

BATTERY

- 2016 – ongoing – Battery System (BESS) 15 MW, 20 MWh
- Frequency Control



# Hydrohub Fenne – Project facts

## Goal

Generation of green hydrogen and oxygen, especially to support decarbonisation in hard to abate industries like steel industry or public transport in the Saar region.

## Site

Völklingen-Fenne (SL), existing power plant site.

## Pipeline connection

Site is connected to oxygen and NG grid. The NG grid shall be transformed to hydrogen grid and connected to the **mosaHYc**-project.



## Project facts

<b>Electrolysis capacity</b>	appr. 53 MW <sub>el</sub> PEM-Electrolysis
<b>Amount of H2 produced</b>	~990 kg H <sub>2</sub> /h
<b>FID</b>	expected Q1/2024
<b>Commissioning</b>	2027



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# Duisburg Walsum Power Plant Site



- 1957 – 1988 Unit 6 – 68 MWeI
- 1959 – 2014 Unit 7 – 150 MWeI
- 1960 – 1988 Unit 8 – 150 MWeI
- 1988 – 2017 Unit 9 – 410 MWeI
- 2013 – ongoing Unit 10 – 790 MWeI

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2016 – ongoing – Battery System (BESS) 15 MW, 20 MWh

- Frequency Control

# Project Developments at Duisburg Walsum Site

- 1 HV line incl. safety zone (Amprion)
- 2 380 kV Switchyard (Amprion)
- 3 Electrolyser up to 550 MWeI
- 4 Steady Green Energy 150 MW, 600 MWh (BESS)
- 5 Walsum Unit 10 790 MW USC: first studies on conversion to low carbon fuel (e.g. biomass, natural gas)
- 6 DoHa Hydrogen Pipeline
- 7 15 MW, 20 MWh BESS
- 8 Walsum unit 7 – 9 (decommissioned)





# Green Hydrogen for the future of the heavy industry: HydrOxy Hub Walsum

## Facts:

- ✓ H<sub>2</sub> - lighthouseproject to reach climate goals
- ✓ Significant decarbonisation of the industry in Duisburg
- ✓ Goal: Production of green hydrogen(H<sub>2</sub>) and heat
- ✓ Production of approx. 16,000 tonnes of green hydrogen per year
- ✓ Footprint: approx. 50,000 m<sup>2</sup>
- ✓ innovative Technology: plant design is modular, first phase of 150MW electrical power, further 2 phases to reach 500MW
- ✓ Planned commissioning: End of 2027





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# Summary



CO<sub>2</sub> reduction target makes coupling of the sectors mandatory.

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Power infrastructure in populated and industrialized area shall be converted into Energy hubs, which

- are couplings between the sectors,
  - have trained personal,
  - enable multi-purpose business models,
  - provide flexible solution close to the energy demand,
  - are important for a successive transformation in contrast to North-South segregation.
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Coal fired power plant sites enable very large advantages for future climate-neutral energy supply and are one part of solution for decarbonization of industry

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